Results: Of the 415/432 analysable segments, 148 (38%) exhibited normal and 267 (62%) abnormal contractility at rest (147 hypokinetic, 120 akinetic). PSS was more prevalent in segments without CR than with CR [61% (50/82) vs. 45% (84/185), p=0.002]. Importantly, only peak systolic SR under dobutamine differed between PSS with and without CR (-0.54 ±0.02 s^{-1} vs. -0.37±0.02 s^{-1}, p<0.001), while baseline peak ε and SR did not.

Conclusion: PSS is not a specific marker of viability and longitudinal peak strain rate by speckle tracking under dobutamine could be used to differentiate PSS segments with contractile reserve.

135

In vivo reduction of radiation exposure with a single-source coronary CT angiography: effects of optimal parameters settings in real life conditions

Alain Tavildari, Luc Maillard, François Vochelet
Clinique AXIUM, Cardiologie, Aix En Provence, France

Background: Coronary computed tomographic angiography (CCTA) has become a key diagnostic exam for coronary artery disease (CAD); however, radiation exposure as a result of the exam has been deemed too high.

Objectives: The purpose of this study was to assess the feasibility of in vivo radiation reduction using optimal parameters during a CCTA with a single source 64-slice computed tomography (CT): General Electric Healthcare VCT XT.

Methods: Acquisition of 137 consecutive patients for examination of native coronary arteries with suspected CAD was performed with optimized parameters. Prospective acquisition mode, called snap shot pulse (SSP), was performed when a heart rate under 65 bpm was obtained, retrospective acquisition mode was used otherwise. Coronary artery segments were systematically analyzed. Stenosis of 50% or more were considered as obstructive.

Results: Examination of all segments was feasible. Mean dose length product (DLP) of 56+/-22.2 mGy.cm (0.7+/-0.3 mSv) with SSP (n=117) was significantly lower than mean DLP of retrospective acquisition mode: 532 +/- 130.8 mGy.cm (7.4 +/- 1.8 mSv) (n=20), p<0.0001. Compared to conventional coronary angiography, SSP significantly reduced irradiation exposure with respectively 8.54 +/- 2.16 mSv versus 0.87 +/- 0.42 mSv in 13 patients, p<0.0001.

Conclusions: Coronary CT using very low X-ray dosage is feasible and accurate. SSP with optimal parameters settings delivered the lowest radiation dose, up to ten times lower than conventional coronary angiography.

136

Impact of 2D echocardiography on Longitudinal Global Strain by Speckle Tracking for Assessing Left Ventricular Systolic Function

Laurent Macron (1), Alexandre Bensaid (1), Julien Nahum (1), Laurens Mitchell-Heggs (1), Leslie Deal (1), Jean-François Deux (2), Pascal Guéret (1), Pascal Lim (1)
(1) Hopital Henri mondor, cardiologie, Créteil, France – (2) hopital Henri mondor, radiologie, Créteil, France

Objective: To evaluate the impact of echocardiography 2D image quality on longitudinal global strain for assessing left ventricular (LV) systolic function.

Methods: The study was conducted in 54 patients, 29 with a poor acoustic window (mean=5 non analyzable segments/patient) and 25 with a good 2D image quality. LV ejection fraction (LVEF) by Simpson biplane and longitudinal global strain by speckle tracking were compared to LVEF by MRI.

Results: Global strain was closely correlated to LVEF by MRI both in patients with (r=0.79, p<0.0001) and without (r=0.81, p<0.0001) a poor acoustic window. In contrast, 2D LVEF was strongly affected by images quality (95%CI agreement with MRI at 12% and 26% in patients with and without a good image quality, respectively). Importantly, reproducibility remained low for global strain (10%) independently of the image quality.

Conclusion: In patients with a poor acoustic window, longitudinal global strain by speckle tracking remained closely correlated with LVEF by MRI and may be used as an alternative to 2D LVEF for assessing LV function.

137

Usefulness of helical computed tomography for the detection of free floating thrombi in right heart in acute pulmonary embolism

Nicolas Mansencal, David Attias, Vincent Caille, Julie Guiader, Imad Abi Nasr, Pascal Lacombe, Antoine Vieillard-Baron, Olivier Dubourg
AP-HP, Hôpital Ambroise Paré, Service de Cardiologie, Boulogne, France

Background: Pulmonary embolism (PE) may be associated to free floating thrombi in right heart (FFTRH), with a worse prognosis. Echocardiography was the single imaging tool for their detection, allowing to initiate appropriate treatment. The aim of this study was to assess the prevalence of FFTRH by a systemic use of transthoracic echocardiography in a large series of patients with acute PE and the accuracy of helical computed tomography (CT) for their detection.

Methods: We studied 340 consecutive patients presenting with acute PE. All patients underwent CT and echocardiography. Echocardiography was the gold standard for the detection of FFTRH and CT was systematically used for their detection.

Results: Prevalence of FFTRH was 3.5% in our population of PE. Dyspnea, cardiogenic shock, cardiac arrest and tachycardia were more frequently found in patients with FFTRH. Measurements of right ventricle was well-correlated between echocardiography and CT (r = 0.76 for the right to left ventricular area ratio, with good agreement). Sensitivity and specificity of CT for the detection of FFTRH was respectively 100% (95% CI: 74% to 100%) and 97% (95% CI: 95% to 99%), whereas positive and negative predictive values were 57% (95% CI: 34% to 78%) and 100% (95% CI: 99% to 100%), respectively.

Conclusion: In the present study, prevalence of FFTRH was 3.5% and clinical presentation of FFTRH differs from PE without FFTRH. Helical CT is an accurate for the detection of FFTRH. An FFTRH detected by CT should lead to urge echocardiography.

138

Single or Multibeat Modality for 3D Echocardiography LV Volumes Assessment. Comparison study with MRI

Laurent Macron (1), Alexandre Bensaid (1), Julien Nahum (1), Laurens Mitchell-Heggs (1), Leslie Deal (1), Jean-François Deux (2), Pascal Lim (1), Pascal Guéret (1)
(1) Hopital Henri mondor, cardiologie, Créteil, France – (2) Hopital Henri mondor, radiologie, Créteil, France

Objective: To compare single and multi beat 3D echocardiography for the assessment of left ventricular (LV) volumes and function.

Methods: LV end-diastolic (LVEDV), end-systolic (LVESV) volumes and ejection fraction (LVEF) computed from one and multi-beat (2, 3 and 4) 3D echocardiography (GE-E9, 4DLVQ) were compared to cine-MRI measurements in 50 consecutive patients.

Results: Among patients with analyzable 3D echocardiography (n=35; LVEDV=155±54mL, LVESV=84±49mL, LVEF=49±14%), single and multi-beat modality provided a fair correlation with MRI for LVED (r^2 ranged from 0.8 to 0.85) with no difference for the 95%CI agreement (2SD ranged from 42-50ml). However, agreement for LVES volume was broader for one beat [2SD=41ml] than for multi-beat [2SD=31ml for 2, 35ml for 3 and 4 beat]. Consequently, the best accuracy for LVEF measurement was obtained using two beat modality (r^2=0.85; p<0.0001; 2SD=11%) with a good inter-observer variability (10%).

Conclusion: Multi-beat remained superior to single beat modality for the assessment of LV volumes and ejection fraction.